Welcome

Restoration Advisory Board Meeting

Robins Air Force Base

June 12, 2003

Restoration Advisory Board Meeting Robins Air Force Base

June 12, 2003

Theme:

Remedial Systems Optimization

Welcome and Program Introduction

Mr. Jim Harden

Community Co-Chair

Optimization of Horizontal Well

Mr. Jimmy Whitmer, GeoSyntec Consultants

12 June 2003

OVERVIEW

- History and Purpose of Horizontal Wells
- Well Specifics - Building 645 Well
- Well Operation Before Optimization Program
- Optimization Activities
- Current Status of Well Operation
- Summary

HISTORY AND PURPOSE

- Plumes may be located under buildings
- Use of vertical wells limited by structures (buildings, runways)
- Horizontal wells first used for environmental restoration in early 1990s

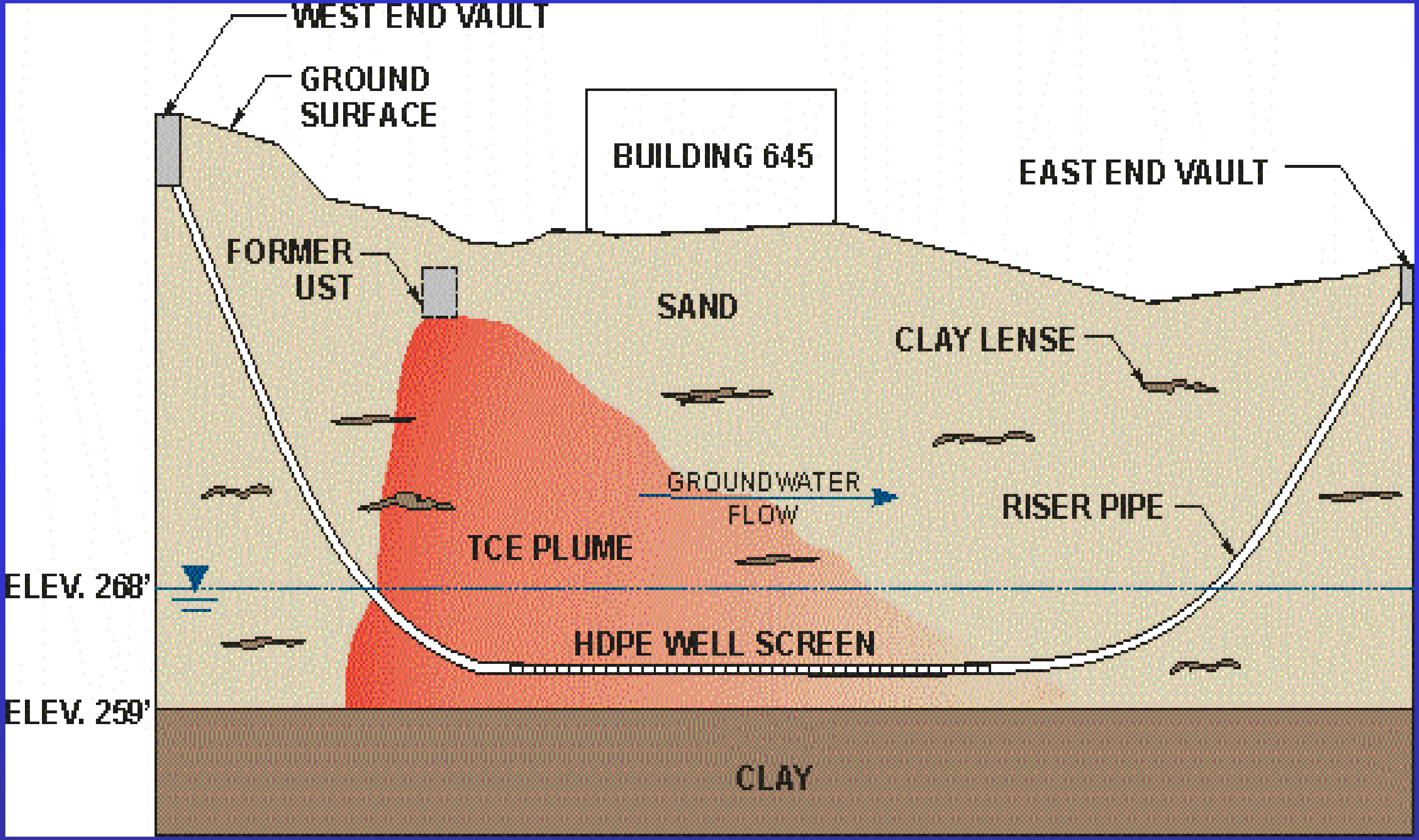
BACKGROUND - BUILDING 645

- Release of TCE below building
- TCE migrated to bottom of surface aquifer
- SVE system effectiveness limited by high groundwater level

BACKGROUND - BUILDING 645

- Horizontal recovery well installed in 1999 to remove TCE and lower groundwater level
  - Enhances SVE performance
- Modeling predicted flow rate of 40-60 gallons per minute (gpm) with four feet of groundwater drawdown

BUILDING 645 HORIZONTAL WELL


WEST END VAULT
GROUND SURFACE
BUILDING 645
EAST END VAULT
FORMER UST
SAND
CLAY LENSE
GROUNDWATER FLOW
RISER PIPE
TCE PLUME
ELEV. 268'
HDPE WELL SCREEN
ELEV. 259'
CLAY

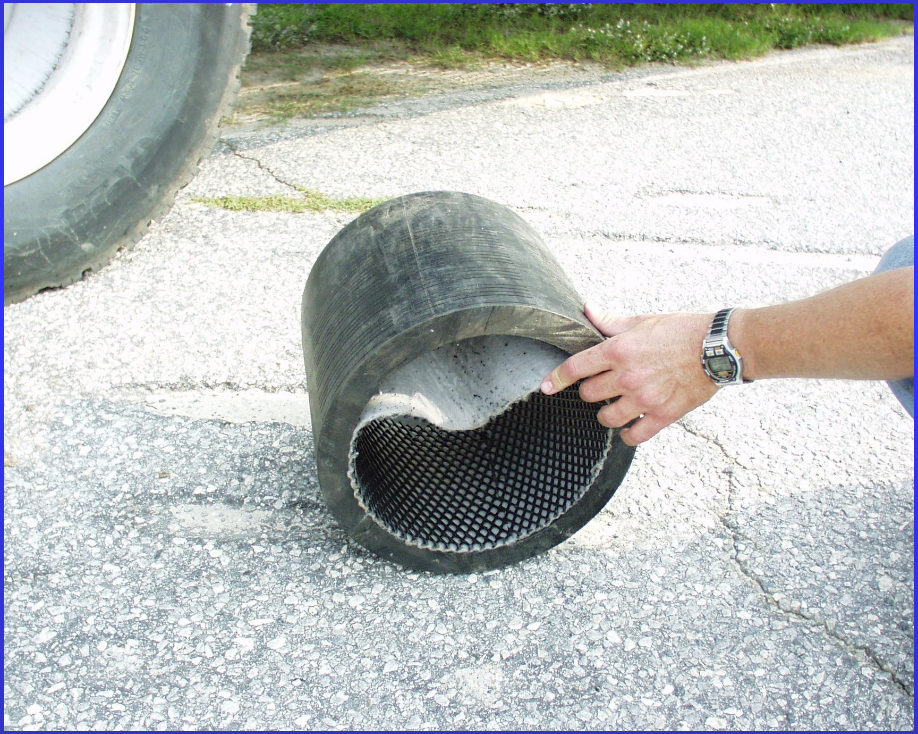
NATURE OF PROBLEM

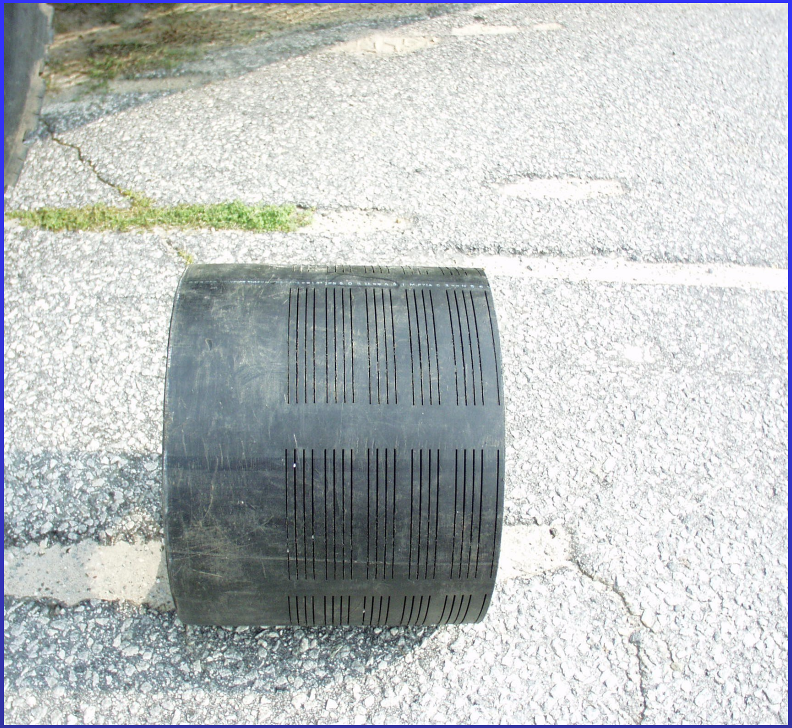
- Well pumped 15.5 gpm June - August 2000
- No significant lowering of water table observed – only seasonal variance
- SVE system only marginally effective
- Average flow rate dropped to 6 gpm by October 2001
- Pump difficult to access for preventive maintenance

CAUSES OF LOW WELL YIELD

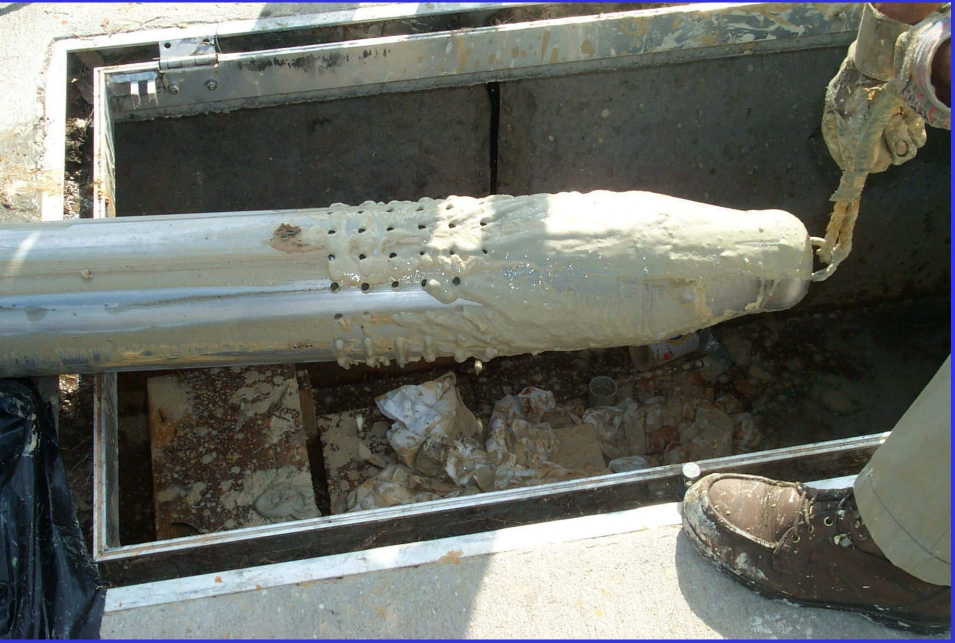
- Filter fabric lining inside well screen clogged with sediment and drilling fluid
- Soil porosity reduced by injection of bentonite clay drilling fluid during well installation
- Well was not adequately developed

WELL SCREEN
FABRIC AND SLOT SIZE

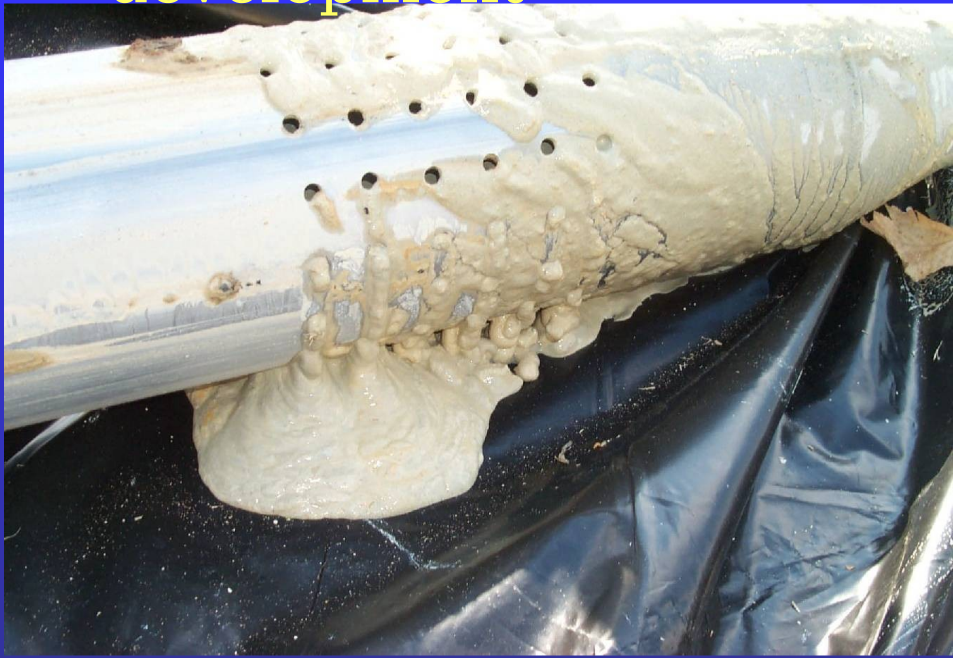




HORIZONTAL WELL PUMP



Drilling fluid on pump indicates inadequate well development



OPTIMIZATION STEPS

- Remove filter fabric material
- Remove sediment & drilling fluid from well interior
- Develop aquifer formation outside the well screen
- Remove fluid and fine grained sediment from outside the well

OPTIMIZATION APPROACH

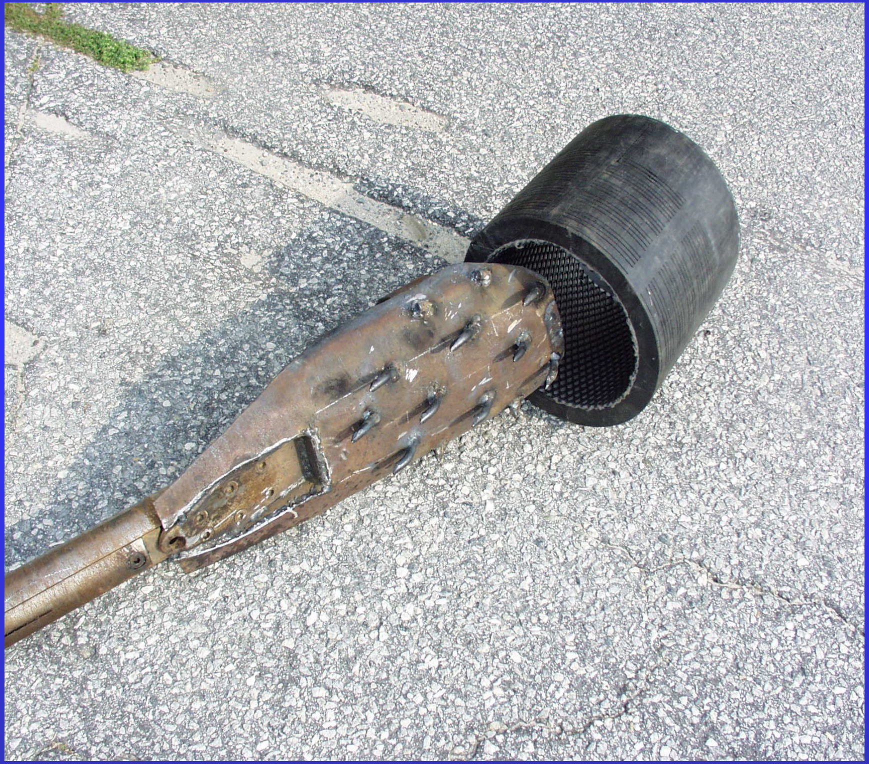
- Filter fabric removal
- Jetting and vacuuming
- Surge blocking
- Jetting and vacuuming

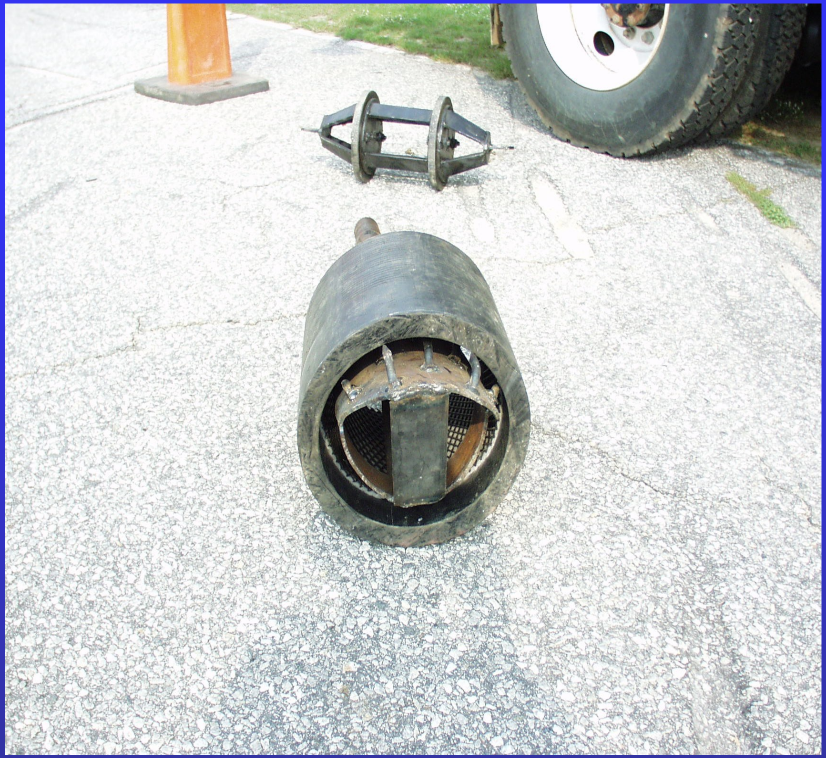
SITE OVERVIEW

REHABILITATION ACTIVITIES: FABRIC REMOVAL

- More sand in well than anticipated
- Sand caused fabric to seize and ripped as it was pulled out
- Multiple attempts to pull failed
- Fabric material ground into smaller pieces
- Pulled clumps of fabric out with reamer and surge block

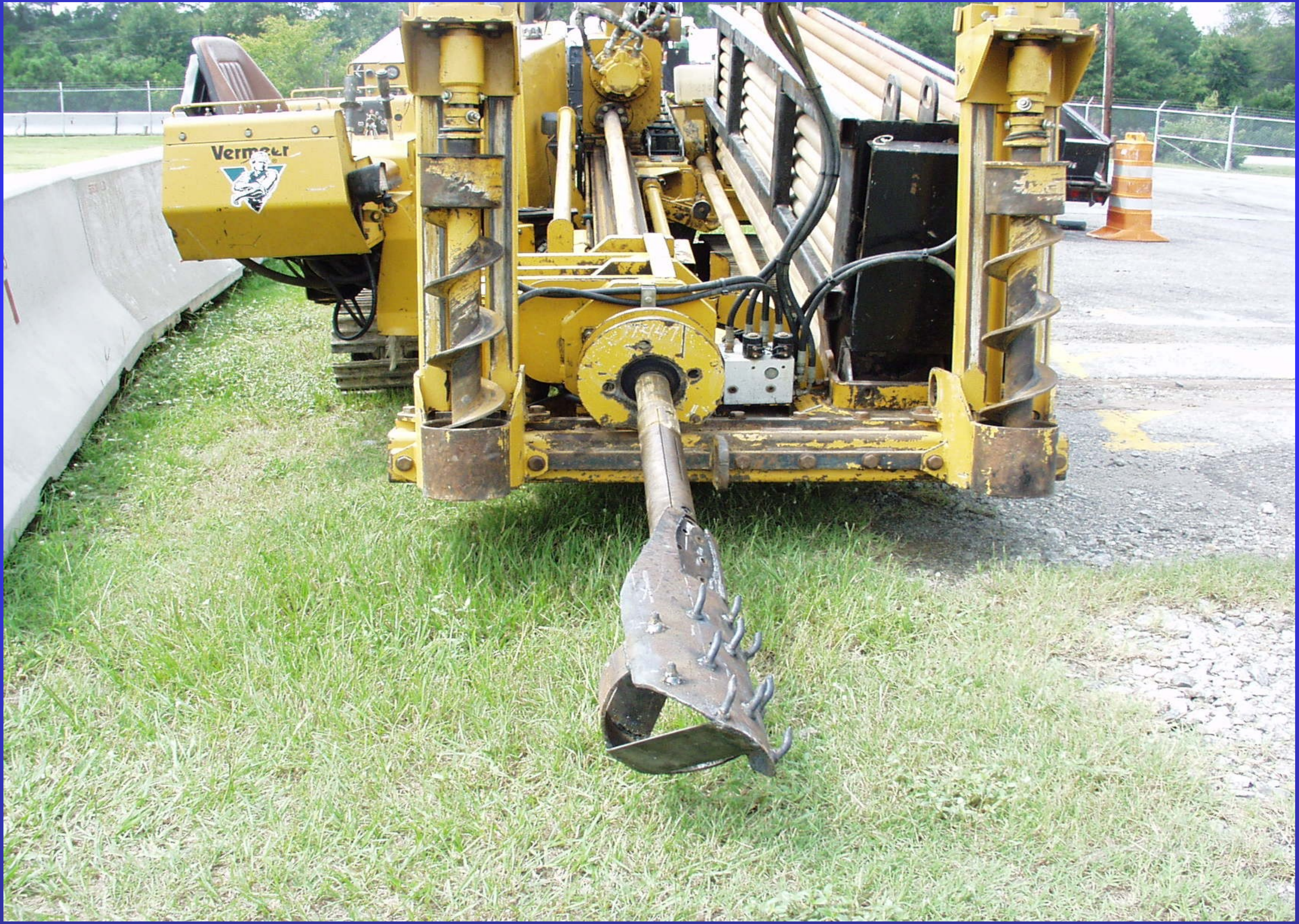
INITIAL FABRIC EXTRACTION TOOL



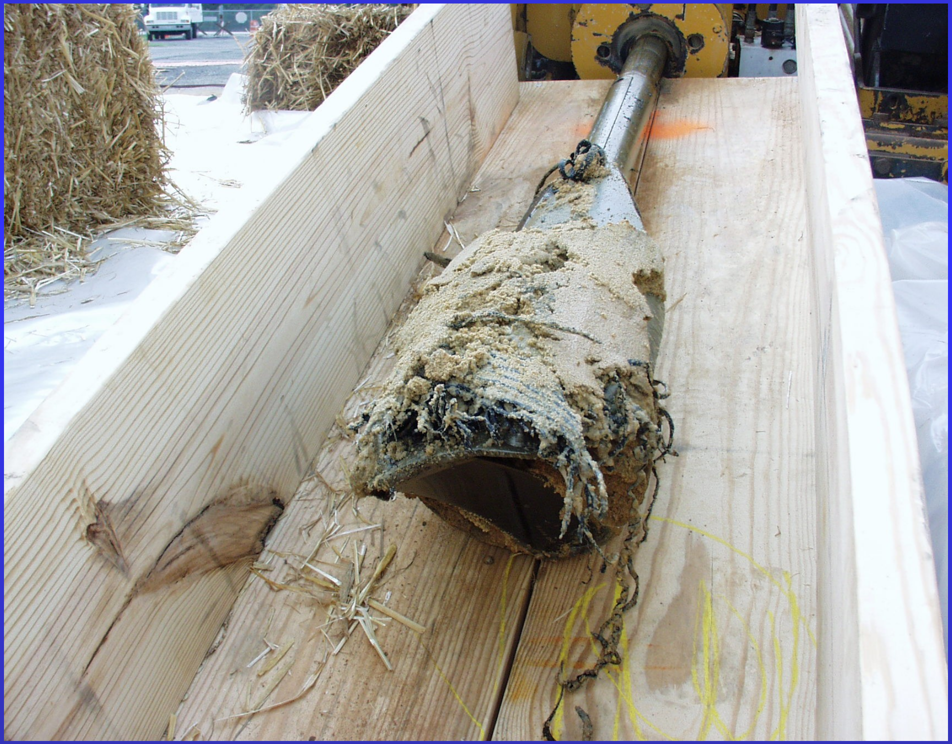


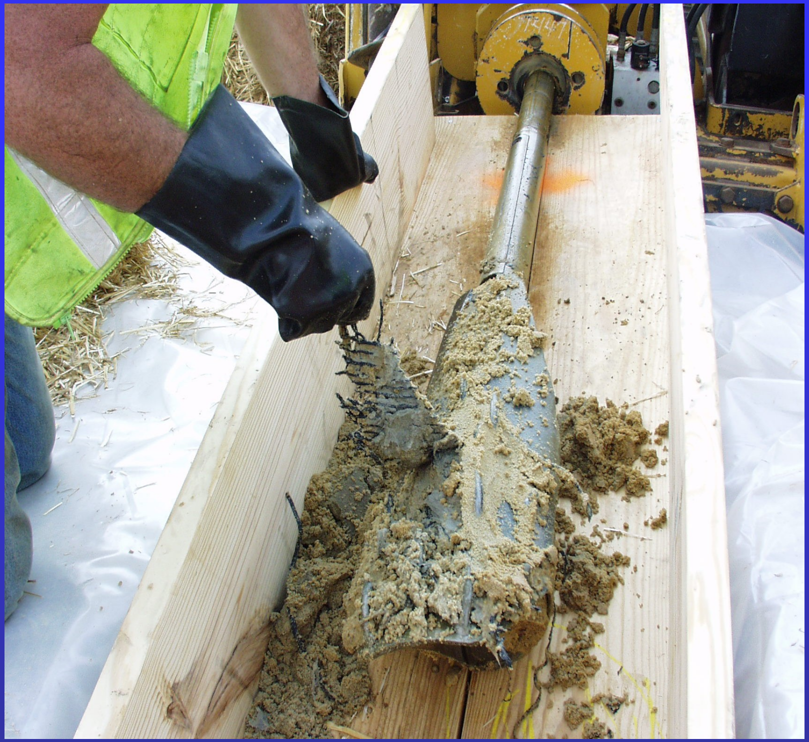
Robins AFB
1997 Environmental Excellence Award Winner
Restoration Advisory Board

DRILLING RIG WITH EXTRACTION TOOL

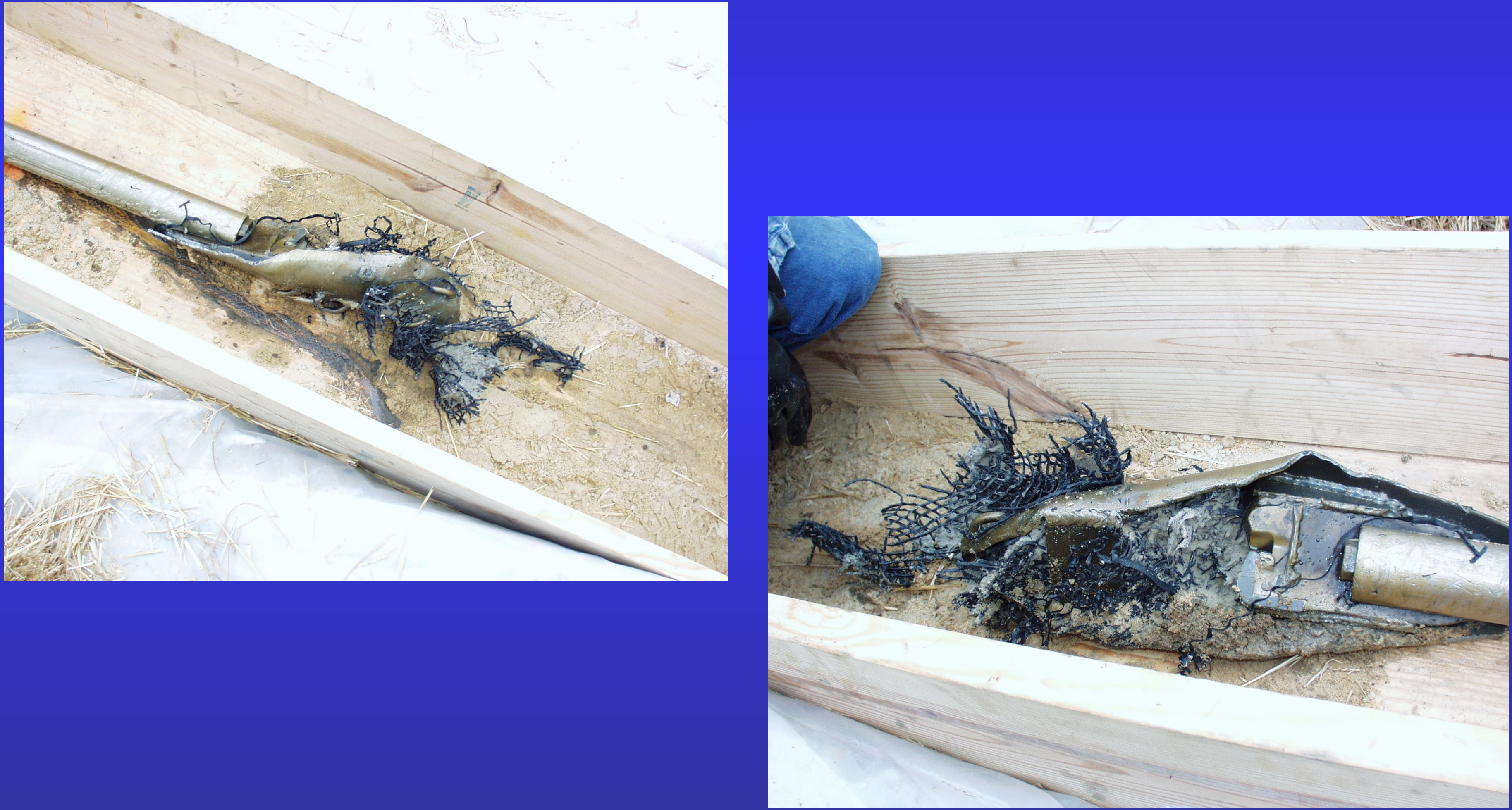


FABRIC AND SAND ON EXTRACTION TOOL



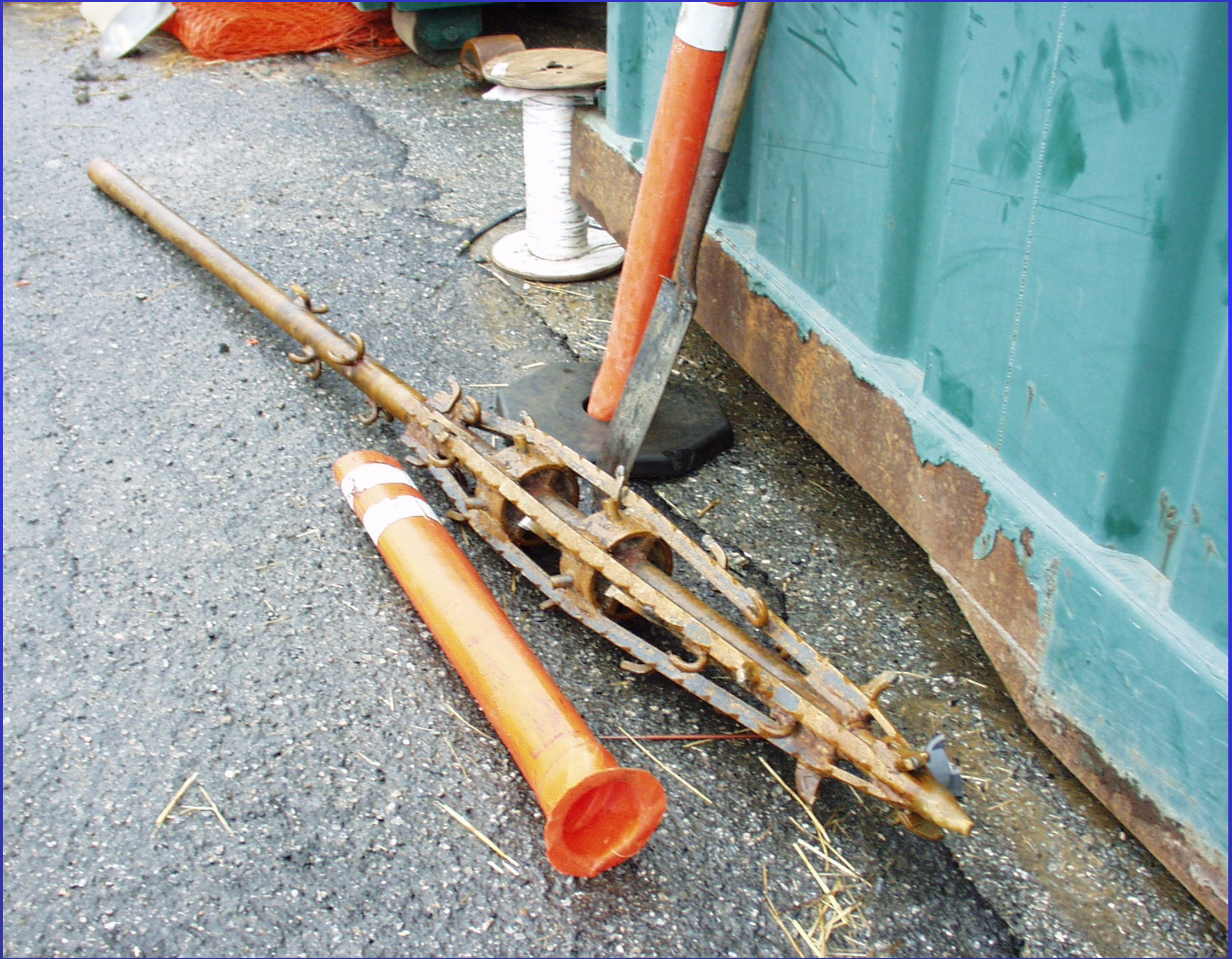


DEFORMED EXTRACTION TOOL



FABRIC SHARDS AND SAND REMOVED FROM WELL INTERIOR

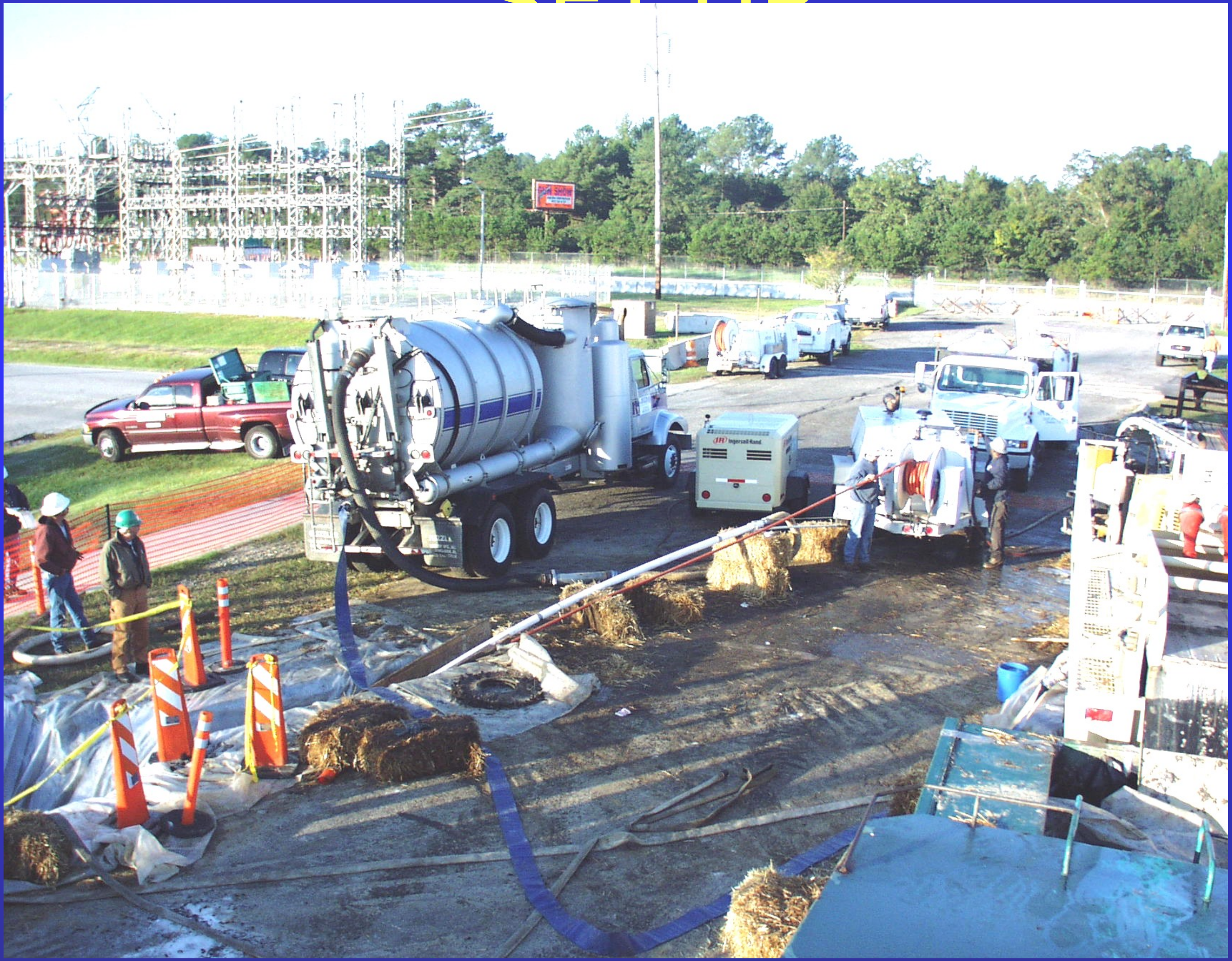
ULTIMATE FABRIC EXTRACTION TOOL



REHABILITATION ACTIVITIES: JETTING & VACUUMING

- Used to lift sediment and remaining fabric out of well
- Depth of well and water table at limits of vacuum lift
- Added air and water to increase pressure and lower lift requirement

JETTING AND VACUUMING SET UP


Ingersoll-Rand

JET SPRAY FROM SEWER JETTING TOOL

Robins AFB
1997 Environmental Excellence Award Winner
Restoration Advisory Board

RECOVERED MATERIALS FROM JETTING AND VACUUMING

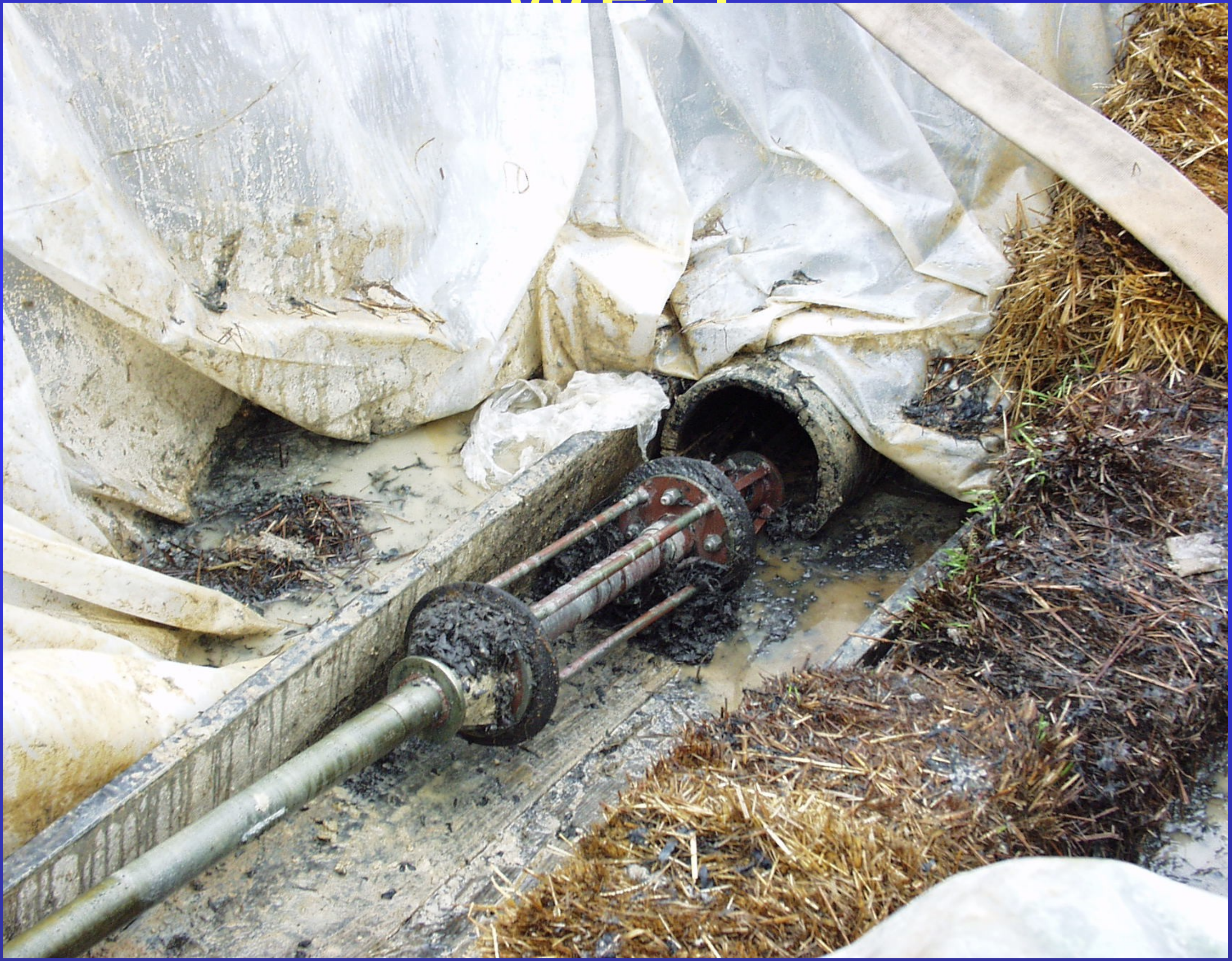
Sand, fluid, and plastic materials

UZZLE
UZZLER MFG., INC
ZZLER
R MFG., INC.
NGHA
VAC-T

REHABILITATION ACTIVITIES: SURGE BLOCKING

- Injected development fluid during process
- Multiple surge events for two days
- Removed more fabric and sediment

SURGE BLOCK AFTER PULLING THROUGH WELL

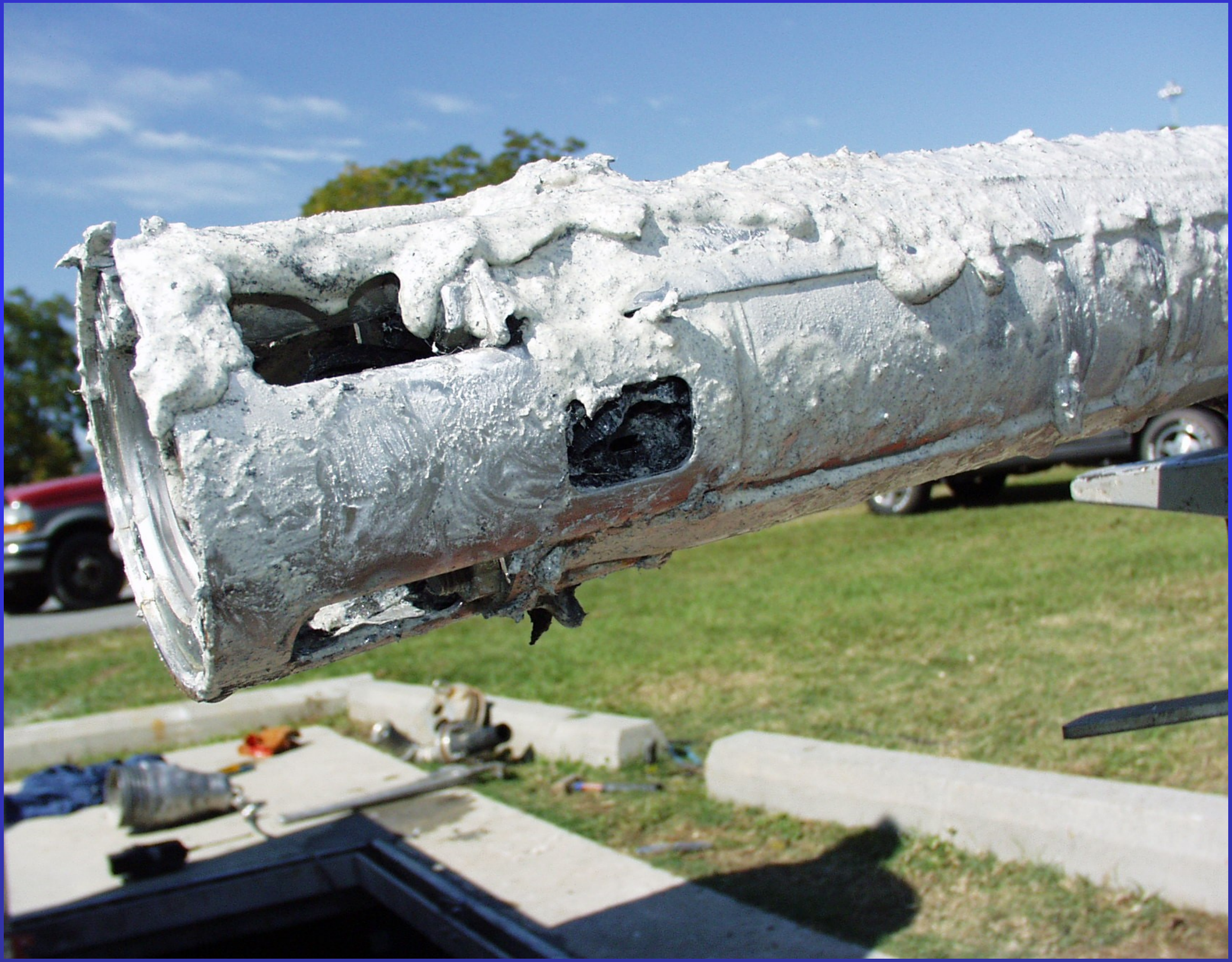


TRIAL START-UP

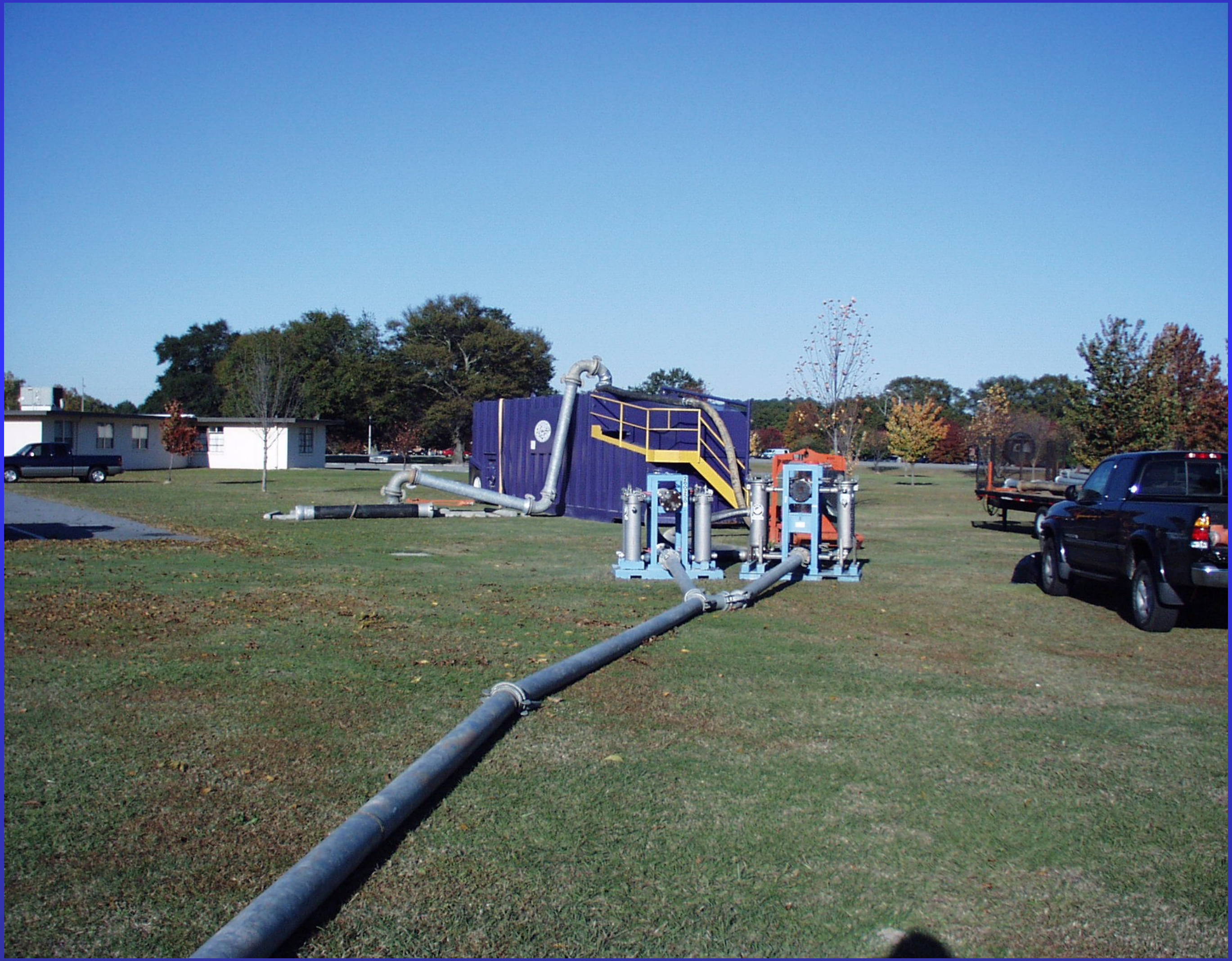
- Installed pump clogged after two hours with fabric and sediment
- Solution: well flushing using high velocity, high flow, volume water

PUMP MATERIAL CLOG

Fine sand, fabric, and plastic



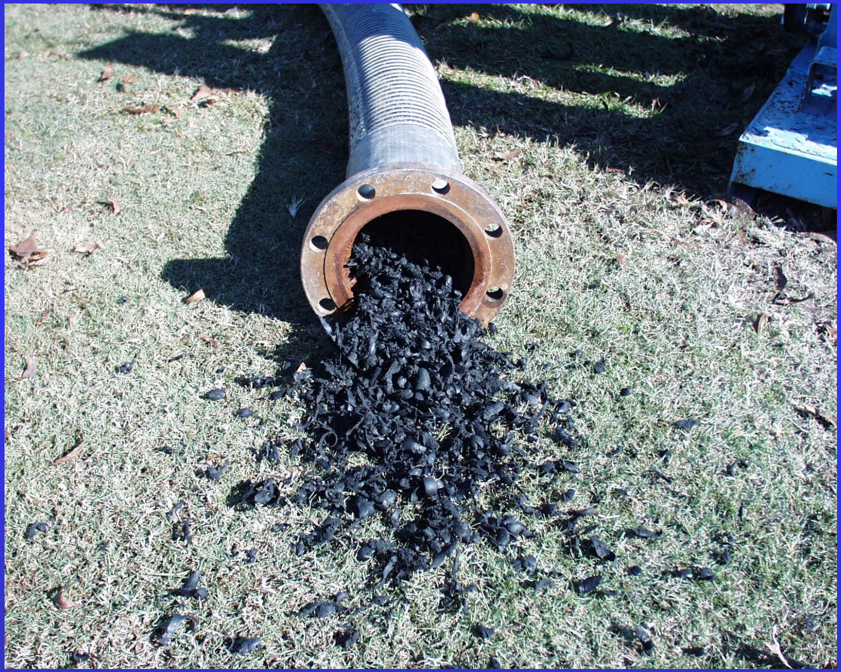
WELL FLUSHING DISCHARGE END

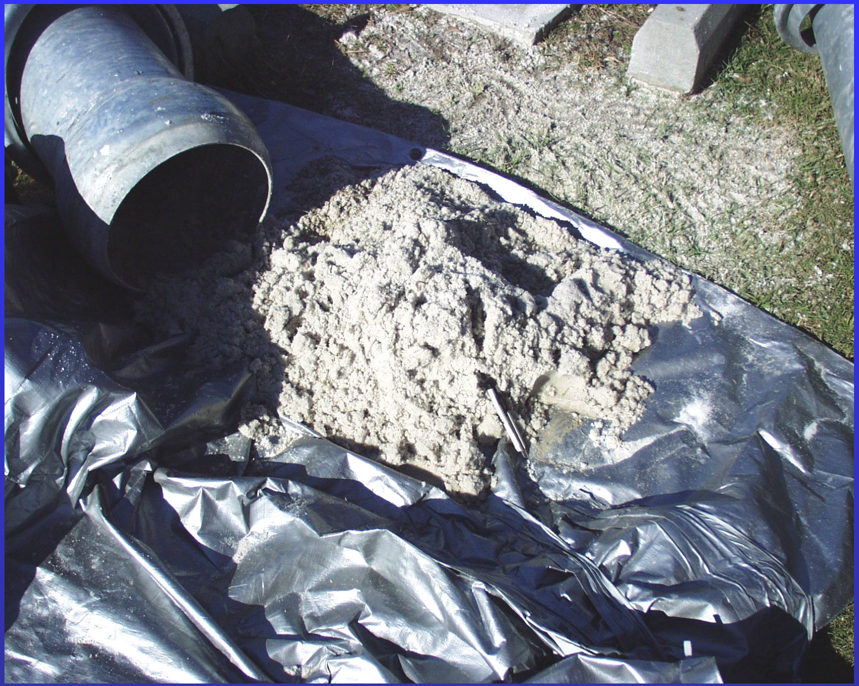


WELL FLUSHING

- Removed fabric material and plastic shards
- Removed sediment
- Pump reinstalled

PLASTIC SHARDS AND SAND FROM FLUSHING ACTIVITY





RESULTS OF OPTIMIZATION

- Well now pumping at up to 55 gpm
- SVE wells are dry – water table lowered
- Pump installation and removal easier due to removal of sediment

SUMMARY

- Well performance depends on design
- Well installation affects performance
- Well development is critical to operation
- Optimization can bring real benefits – avoided installation of a new well at B 645
- Well flushing is very effective

Horse Pasture Site Performance Based Remediation

Robins AFB
1997 Environmental Excellence Award Winner
Restoration Advisory Board

Mr. John Matthews, AFCEE/ERD

June 12, 2003

OVERVIEW

- What is Performance Based Contracting?
- Benefits of PBC
- Process Comparison
- Horse Pasture Site Summary
- Contracting Schedule
- Summary

PERFORMANCE BASED CONTRACTING

- What **is it?**
  - **An approach with minimal focus on contracting process and maximum focus on results**
- Why use it?
  - **To complete clean-ups with site closures in less time and with less direct management**
- Also known as
  - **End State Contracting**
  - **Results Based Product Delivery**

BENEFITS OF PBC

- Community
  - **Ensures continued rapid removal of exposure to hazardous or toxic materials**
  - **Protects the environment**
- Regulators
  - **Assists the mandate to protect the public and environment by accelerating site restoration**
- Government
  - **Reduces overall programmatic cost**
  - **Allows greater focus on mission**

PROCESS COMPARISON

OLD WAY	PBC WAY
Govt writes Statement of Work	**Govt writes Statement of Objectives**
Govt selects technology/methods	**Contractor selects technology/methods**
Govt negotiates with regulators	**Contractor negotiates with regulators**
Continuous govt	**Govt verifies that**

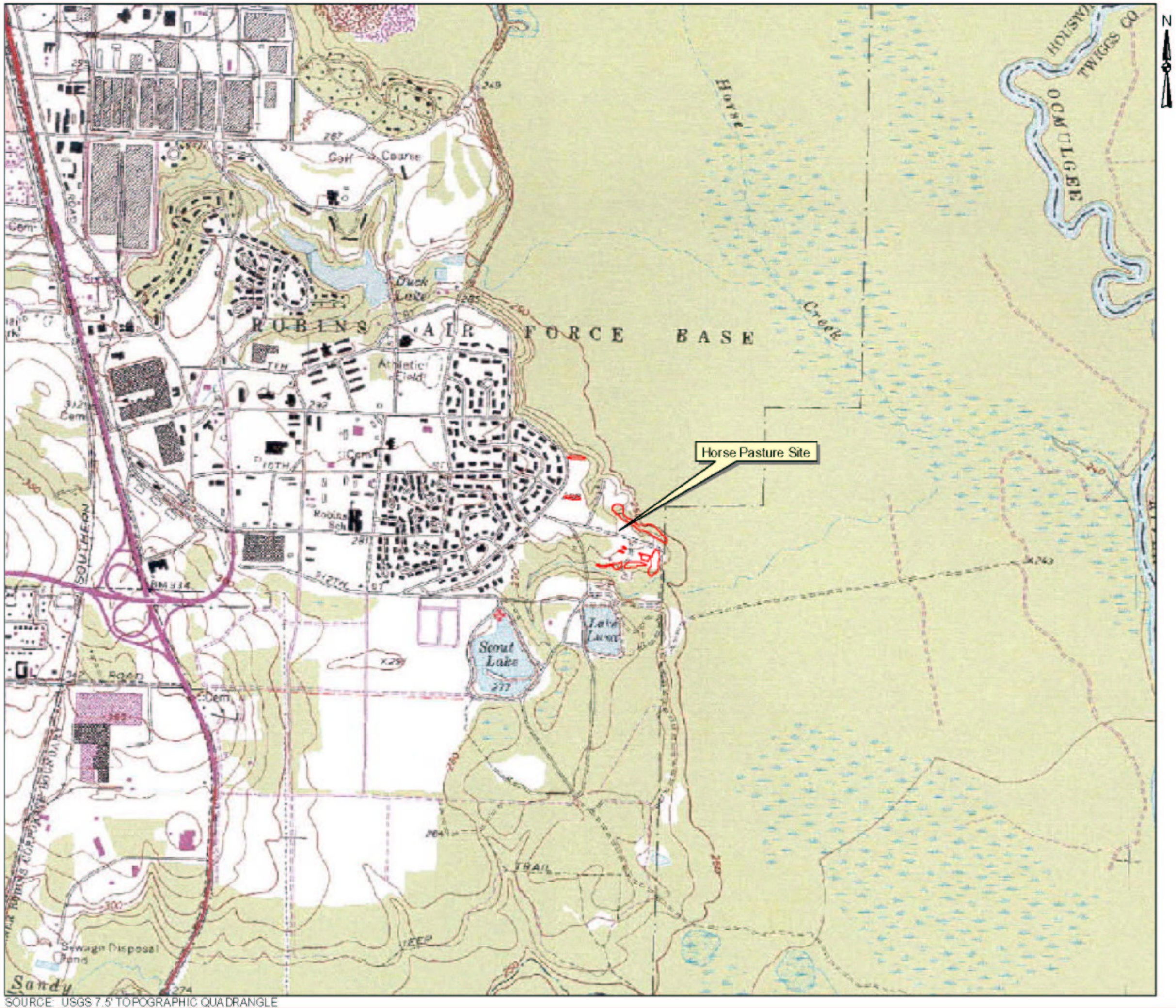
PROCESS COMPARISON, contd.

OLD WAY	PBC WAY
Cost Reimbursable Contracts	**Fixed Price Contracts**
Govt pays contractor for best effort	**Govt pays contractor when milestones/ objectives are completed**
Govt contracts study, design, and remediation phases separately	**Govt contracts study, design, and remediation phase together**

HORSE PASTURE SITE SUMMARY

- 5 Solid Waste Management Units and site groundwater
- History & Contamination
  - **Disposal from 1950s to 1970s**
  - **Soil and groundwater contamination**
  - **Metals, Volatile and Semi-Volatile Organic Compounds**
  - **Currently an active horse pasture**
- Investigation History
  - **Phase I Facility Investigation Report (2000)**
  - **Phase II Facility Investigation Report (2002)**

HORSE PASTURE SITE MAP


N
Horse Pasture Site
ROBINS AIR FORCE BASE
Golf Course
Duck Lake
Athletic Field
Scout Lake
Lake Luna
Horse Creek
OCMULGEE
HOUSTON
TWIGGS CO.
SOUTHERN
Sewage Disposal Pond
Sandy
TRAIL
274

SOURCE: USGS 7.5' TOPOGRAPHIC QUADRANGLE

N:\ROBINS AFB\GIS\GIS-STATECRD\HORSE PASTURE RFI FIG2 2.APR

ROBINS AIR FORCE BASE
TOPOGRAPHIC MAP OF
HORSE PASTURE AREA
HORSE PASTURE PHASE II RFI
ROBINS AIR FORCE BASE, GA

LEGEND

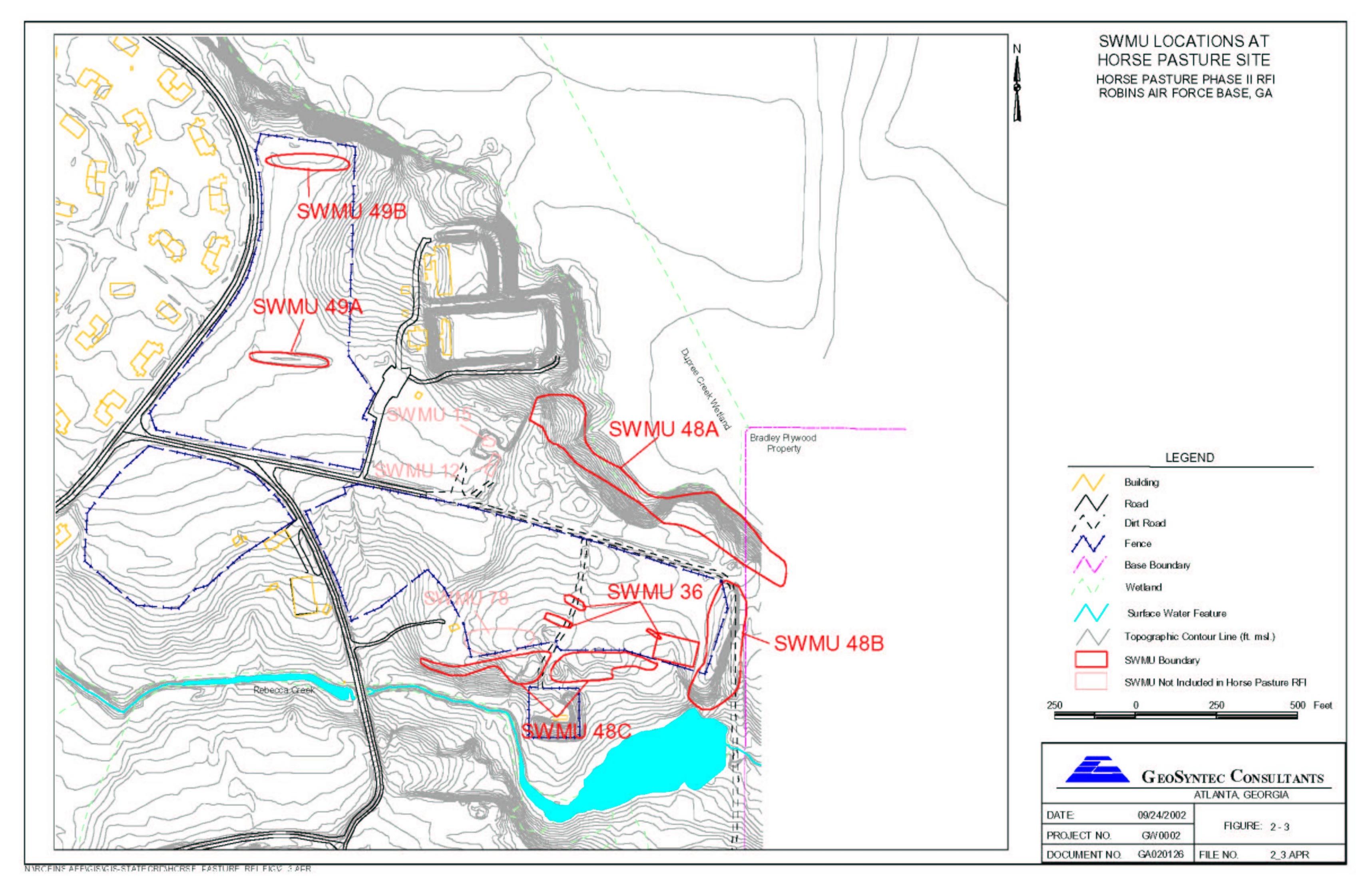
- SWMU Boundary
- Road
- Dirt Road
- Base Boundary
- Topographic Contour Line (ft. msl.)

1500 0 1500 3000 Feet

GEOSYNTEC CONSULTANTS
ATLANTA, GEORGIA

DATE:	09/24/2002	FIGURE:	2 - 2
PROJECT NO.	GW0002		
DOCUMENT NO.	GA020126	FILE NO.	2_2.APR

HORSE PASTURE SITE SWMU MAP


SWMU LOCATIONS AT
HORSE PASTURE SITE
HORSE PASTURE PHASE II RFI
ROBINS AIR FORCE BASE, GA
N
SWMU 49B
SWMU 49A
SWMU 15
SWMU 12
SWMU 48A
SWMU 78
SWMU 36
SWMU 48B
SWMU 48C
Dupree Creek Wetland
Bradley Plywood Property
Rebecca Creek
LEGEND
Building
Road
Dirt Road
Fence
Base Boundary
Wetland
Surface Water Feature
Topographic Contour Line (ft. msl.)
SWMU Boundary
SWMU Not Included in Horse Pasture RFI
250
0
250
500 Feet
GEOSYNTEC CONSULTANTS
ATLANTA, GEORGIA
DATE: 09/24/2002
PROJECT NO. GW0002
DOCUMENT NO. GA020126
FIGURE: 2 - 3
FILE NO. 2_3.APR
N:\ROBINS AFB\GIS\GIS-STATEGRD\HORSE_PASTURE_RFI FIG2_3.APR

HORSE PASTURE CLEANUP OBJECTIVES

- Proposal Alternative 1
  - **No Further Action (SWMUs 36; 48A, B, C; and 49)**
  - **No Further Action for Site Groundwater**
- Proposal Alternative 2
  - **No Further Action (SWMUs 36; 48A, B, C; and 49)**
  - **Permanent containment of groundwater plume at the Base boundary**
  - **Reduction of all groundwater contaminants below defined concentrations**

Robins AFB Restoration Advisory Board

HORSE PASTURE SITE CONTRACTING MILESTONES

- Draft SOO Released to Contractors; 25 Apr
- Contractor Site Visit; 9 May
- Initial Question Submission Period; 9 -23 May
- Initial Question Responses Distributed; Jun

HORSE PASTURE SITE CONTRACTING MILESTONES, contd.

- Final Question Submission Period; Jun
- Final Question Responses Distributed; Jul
- Proposals Due; Aug
- Proposal Reviews and Selection; Aug

SUMMARY

- Performance Based Contracting is beneficial to the government, regulators, and public
- Government outlines objectives rather than methods
- PBC does NOT replace government responsibility
- Robins AFB is currently contracting a PBC project at the Horse Pasture Site

Debris Pit Site Investigation & Removal Action

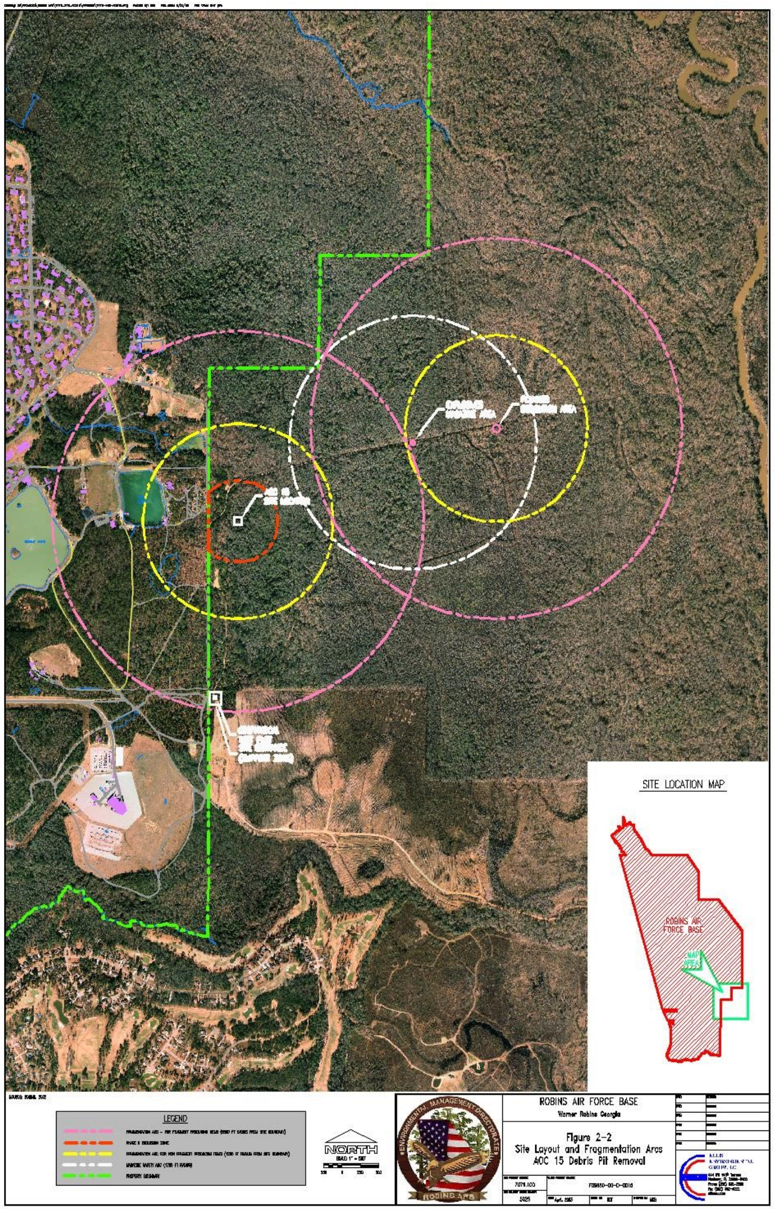
Mr. John Domenech, Ellis Environmental Group

June 12, 2003

DEBRIS PIT (AOC 15) LOCATION

- Located adjacent to (east) Robins AFB
- 100 yards east of Family Camping Area
- Debris pit is 12 meters by 12 meters by 1.5 meters deep
- Site and surrounding area owned by Bradley Plywood Corporation used for silviculture

SITE LAYOUT MAP


SITE LOCATION MAP
ROBINS AIR FORCE BASE
MAP AREA
LEGEND
PROPERTY BOUNDARY
NORTH
ROBINS AIR FORCE BASE
Warner Robins Georgia
Figure 2-2
Site Layout and Fragmentation Arcs
AOC 15 Debris Pit Removal
7071.100
5025
April, 2003
ROBINS AFB
ENVIRONMENTAL MANAGEMENT DIRECTORATE

PREVIOUS INVESTIGATIONS

- Moody AFB EOD team investigated site in 1998
  - Numerous live and inert ordnance- related items found (UXO- unexploded ordnance)
  - Live items destroyed on site

ITEMS FOUND BY MOODY EOD

- Rifle grenades
- Anti-tank and anti-personnel landmines
- Bomb fuzes
- Rocket motors
- Other ordnance-related materials

PHASE II ACTIVITIES

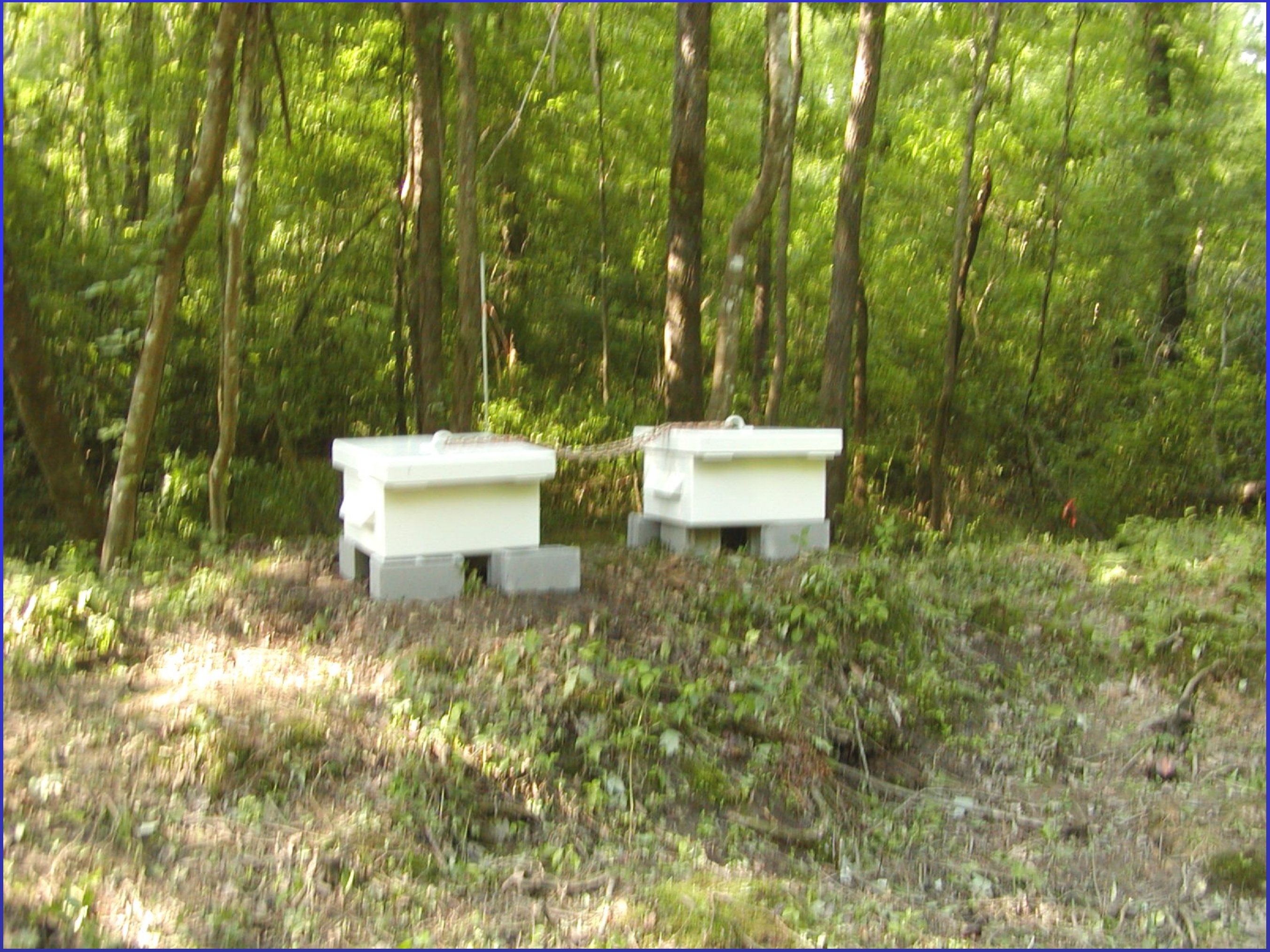
- Site layout
- Vegetation clearance
- Geophysical survey
- Soil sampling
- Mobilization on April 21, 2003

Robins AFB Restoration Advisory Board

SITE LAYOUT

- Exclusion zones and support zones set up
- Demolition area was located in a natural clearing
- Magazine storage area was located along road north of site

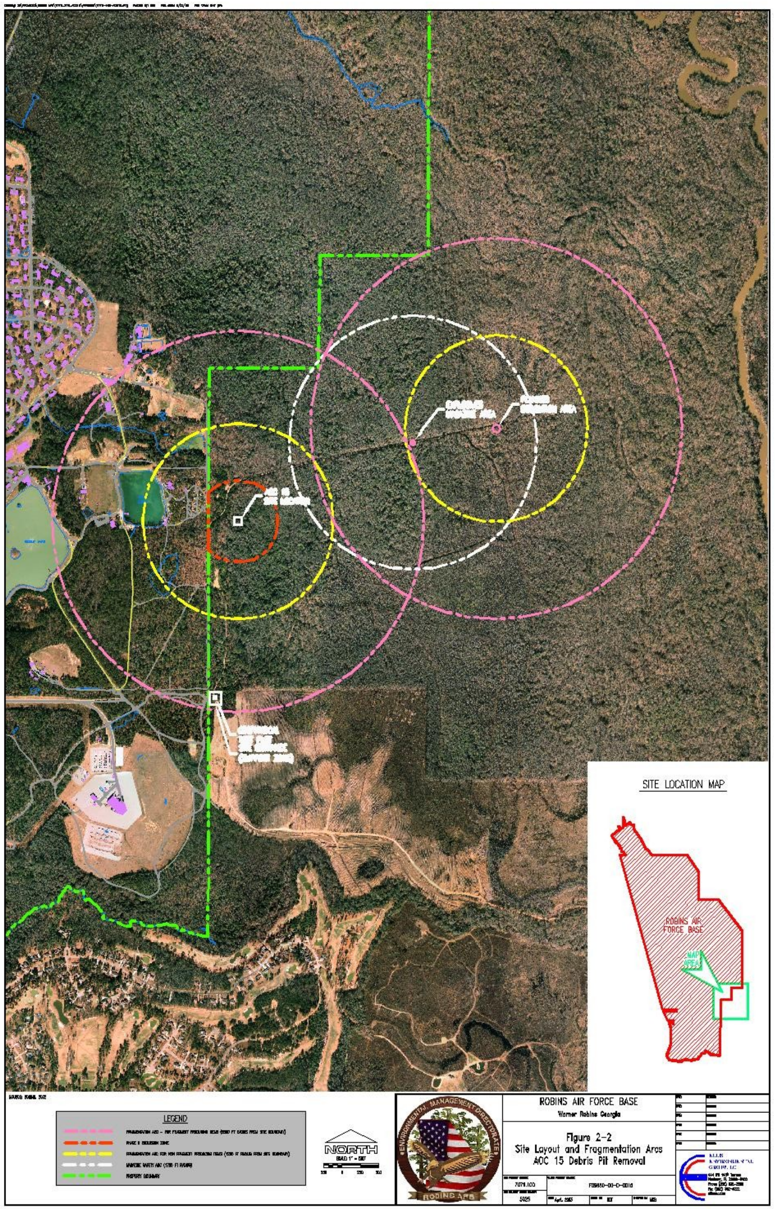
EXPLOSIVE MAGAZINE STORAGE



VEGETATION CLEARANCE

- Trees less than 3 inch diameter (as necessary)
- Brush removal from 100 by 100 foot area

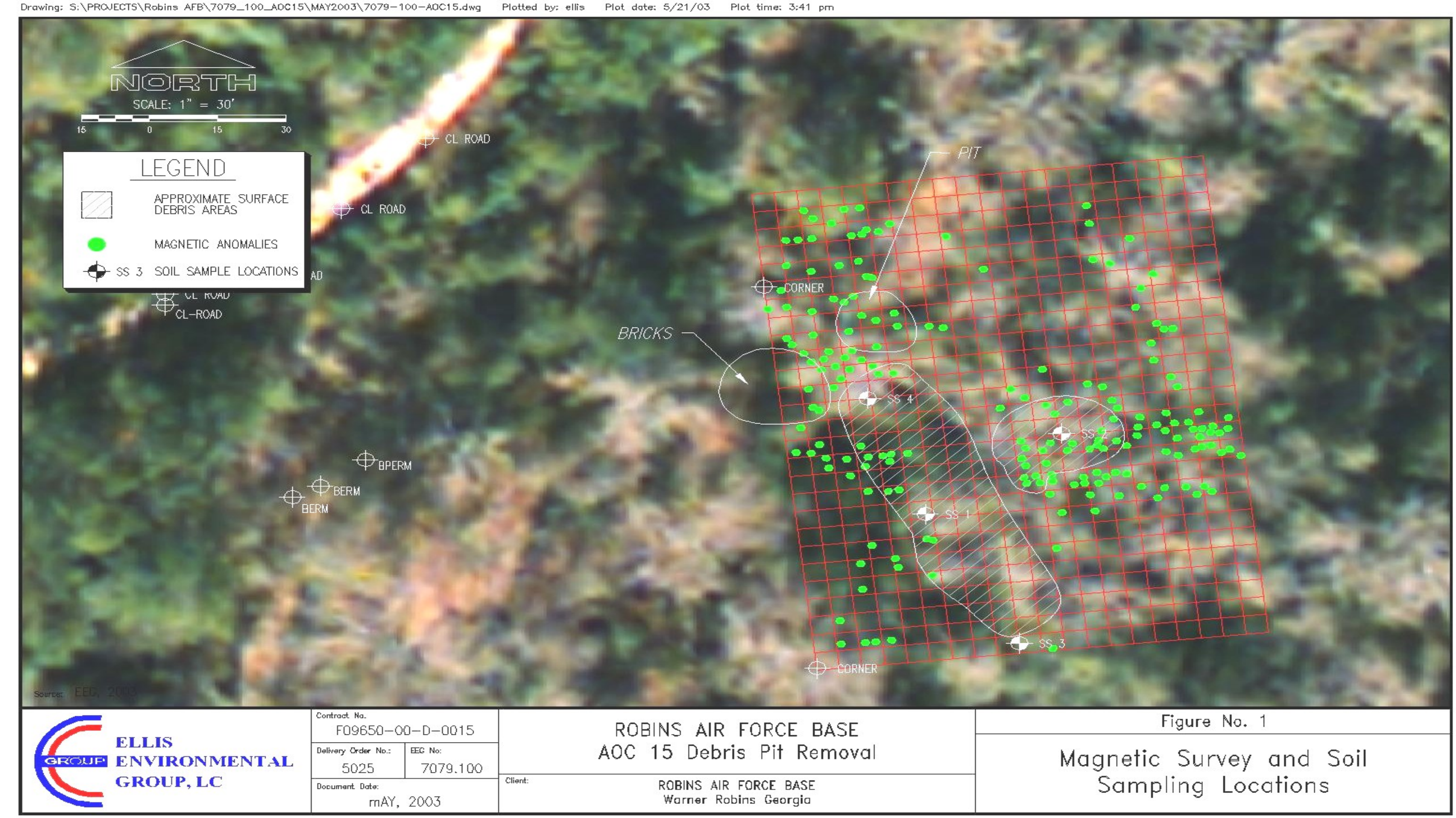
SITE LAYOUT MAP


SITE LOCATION MAP
ROBINS AIR FORCE BASE
MAP AREA
LEGEND
PHASE II EXCLUSION ZONE
PROPERTY BOUNDARY
NORTH
ROBINS AIR FORCE BASE
Warner Robins Georgia
Figure 2-2
Site Layout and Fragmentation Arcs
AOC 15 Debris Pit Removal
7071.100
F09650-00-D-0016
5025
ENVIRONMENTAL MANAGEMENT DIRECTORATE
ROBINS AFB

GEOPHYSICAL SURVEY

- Use magnetometer to locate surface and subsurface items
  - 5-foot lanes set up for survey
  - Subsurface anomaly locations were flagged

MAGNETIC SURVEY & SOIL SAMPLING LOCATIONS


Drawing: S:\PROJECTS\Robins AFB\7079_100_AOC15\MAY2003\7079-100-AOC15.dwg Plotted by: ellis Plot date: 5/21/03 Plot time: 3:41 pm
NORTH
SCALE: 1" = 30'
15 0 15 30
LEGEND
APPROXIMATE SURFACE DEBRIS AREAS
MAGNETIC ANOMALIES
SS 3 SOIL SAMPLE LOCATIONS
CL ROAD
CL ROAD
CL ROAD
CL-ROAD
PIT
CORNER
BRICKS
SS 4
SS 2
SS 1
SS 3
CORNER
BPERM
BERM
BERM
Source: EEG, 2003
ELLIS ENVIRONMENTAL GROUP, LC
Contract No. F09650-00-D-0015
Delivery Order No.: 5025
EEG No: 7079.100
Document Date: mAY, 2003
ROBINS AIR FORCE BASE
AOC 15 Debris Pit Removal
Client: ROBINS AIR FORCE BASE Warner Robins Georgia
Figure No. 1
Magnetic Survey and Soil Sampling Locations

PRELIMINARY SOIL SAMPLING

- Soil samples collected from four borings and analyzed for:
  - Metals
  - Explosives
  - Volatile organics
  - Semi-volatile organics
  - Chemical agents

RESULTS OF SOIL INVESTIGATION

- Only metals detected in soils (all below regulatory limits)
  - Barium
  - Chromium
  - Lead
- Cadmium detected in only one sample

SOIL AND SUBSURFACE FINDINGS

- No evidence of extensive burial pit
- High water table
- Soils at site are non-hazardous

UXO ITEMS FOUND AT SURFACE

- 2.36-in rockets/motors
- M103 nose fuzes
- M100/112 series tail fuzes
- 37 mm complete round
- M1/M3 mines

PHASE III ACTIVITIES

- Excavation of magnetic anomalies
- Demolition operations
- Scrap management
- Post - demolition soil sampling

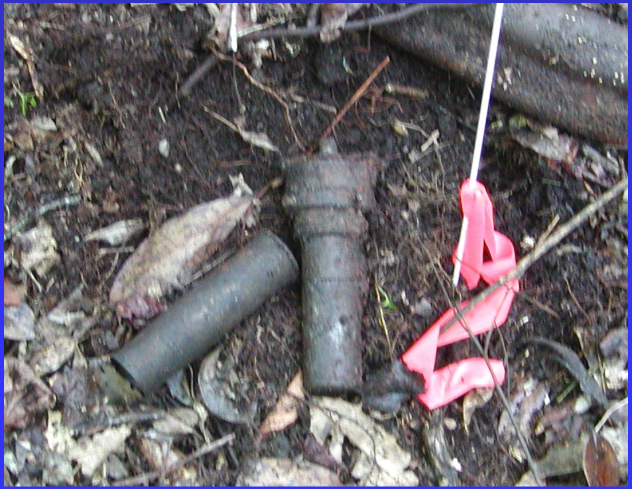
EXCAVATION OF MAGNETIC ANOMALIES

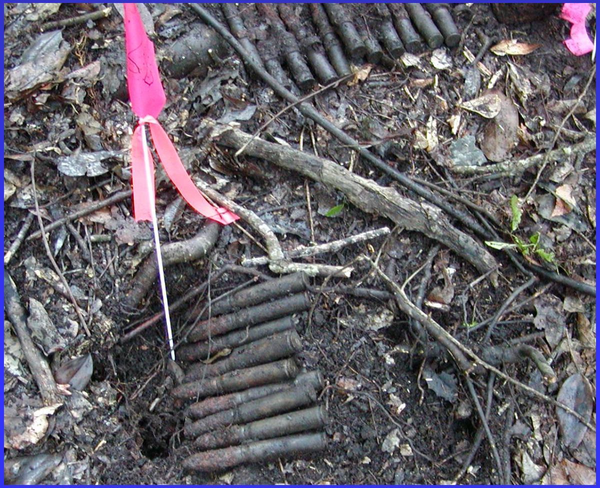
- Magnetometer capable of detecting 5-inch diameter UXO item to depth of 5 feet
- Over 430 subsurface anomalies excavated
- 139 live UXO items excavated

EXCAVATION OF ANOMALIES

UXO ITEMS EXCAVATED

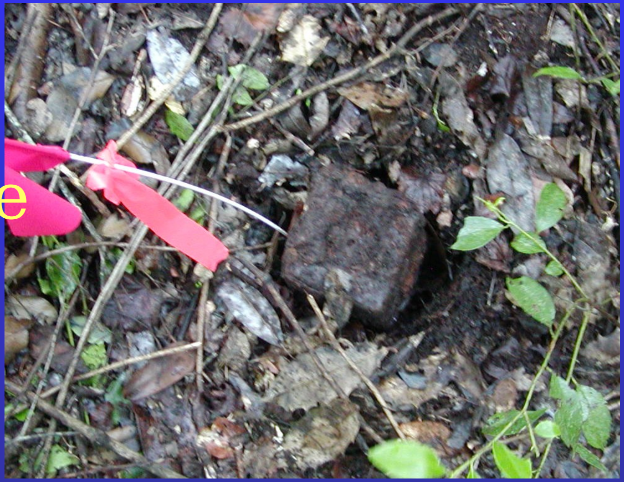
37 mm cartridge & M103 bomb nose fuze

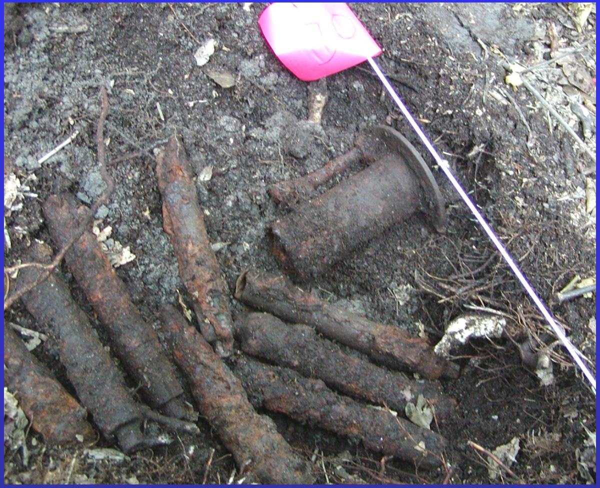




20 mm rounds

M3 mine





2.36 inch rocket motors & M2 mine

DEMOLITION OPERATIONS

- Secure exclusion zone (1250 foot radius)
- Demolition pits set up with UXO and explosives
- Each detonation dampened with sand bags
- Two separate detonations conducted
  - 30 lbs explosives on one detonation
  - 70 lbs explosives on the other

SETTING UP DEMOLITION SHOT

VIDEO OF REMOVAL & DEMO

SCRAP DISPOSAL

- EOD techs certified demilitarized

  (crushed) scrap as inert
- Scrap taken to dealer for disposal

POST - DEMOLITION SOIL SAMPLING

- One sample to ensure demolition operations have not adversely impacted site soils
- Sample collected from demolition pit

New Business and Program Closing

Mr. Jim Harden

Community Co-Chair

Next RAB Meeting
September 11, 2003

Don’t forget…

Please complete the

meeting evaluation and feedback form

and either leave at your place or

give it to Ms. Logue.

Please recycle…

Recycle your name tag and lanyard by leaving them at your place…

We will collect and reuse them at the next RAB meeting.